Confirmation theory

(Article begins on next page)

CHAPTER 30

CONFIRMATION THEORY

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In philosophy of science, formal epistemology, and related areas, *confirmation* has become a key technical term. Broadly speaking, confirmation has to do with how evidence affects the credibility of hypotheses, an issue that is crucial to human reasoning in a variety of domains, from scientific inquiry to medical diagnosis, legal argumentation, and beyond. In what follows, we will address *probabilistic* theories of confirmation. The case for tackling confirmation in a probabilistic framework is easily put. The connection between evidence and hypothesis is typically fraught with uncertainty, and probability is widely recognized as the formal representation of uncertainty that is best understood and motivated.[1] We will thus frame our discussion by positing a set $\boldsymbol{P}$ of probability functions representing possible states of belief concerning a domain described in a (finite) propositional language L. We will also denote as L_c the set of contingent formulae in L (namely, those expressing neither logical truths nor logical falsehoods), and we will have hypothesis h and evidence e belonging to L_c. Finally, $\boldsymbol{P}$ will be assumed to include all *regular* probability functions that can be defined over L (i.e., such that, for any $\alpha \in L_c$ and any $P \in \boldsymbol{P}$, $0 < P(\alpha) < 1$).[2]

[1] Although well-established, probabilistic confirmation theory has not always been popular, nor has it remained unchallenged even in recent times. For prominent critical voices, see Kelly and Glymour (2004) and Norton (2010). As regards earlier influential and non-probabilistic accounts of confirmation, one should mention at least Popper's (1959) notion of "corroboration" through bold successful predictions and Hempel's (1943) analysis of confirmation by instances. There also exist cases which tend to defy the distinction between advocates and critics of probabilistic confirmation theory: Isaac Levi's work is a major example (e.g., Levi 2010). Finally, there are authors who rely on probability to account for evidential reasoning, but not as a representation of belief under uncertainty (as is the case throughout this chapter). This applies, for instance, to Royall's (1997) likelihoodism, as well as to Mayo's (1996) error-theoretic approach. Also see Crupi (2015) for a more extensive discussion.

[2] Regularity can be motivated as a way to represent credences that are non-dogmatic (see Howson 2000: p. 70). It is a very convenient assumption, but not an entirely innocent one. Festa (1999) and Kuipers (2000) discuss some limiting cases that are left aside here owing to this constraint.